TENDER

FOR

SUPPLY & INSTALLATION OF FULLY AUTOMATED LOW TEMPERATURE, HIGH MAGNETIC FIELD PHYSICAL PROPERTIES MEASUREMENT SYSTEM **(PPMS)** IN IIT MANDI

Tender No.: IITMANDI/Admin/PUR-136/2013-14/6208-09

Tender date: 18th December, 2013

Last Date of submission: 31st December, 2013

Indian Institute of Technology, Mandi

Transit Campus: Mandav Hotel, 2nd Floor (Near Bus Stand), Mandi – 175001 (H.P)

Mob.: **98166-14494 email**: shekhar@iitmandi.ac.in

In continuation to our earlier tender notice no. IITMANDI/Admin/PUR-136/2013-14/5768-69 dated 25th November, 2013 Indian Institute of Technology Mandi, Mandi again invites tenders for supply,, erection, installation, Fully Automated Low temperature, High magnetic field Physical Properties Measurement System (PPMS), as per specifications given in the Annexure 1 attached to the Tender form. This retendering is being done, since the no. of bids in response to earlier tender notice was small. All offers should be made in English and should be written in both figures and words. Tender forms can be downloaded from the website (http://iitmandi.ac.in/administration/tenderseoi.html) of the Institute.

The bidders are requested to read the tender document carefully and ensure compliance with all specifications/instructions herein. Non-compliance with specifications/instructions in this document may disqualify the bidders from the tender exercise. **Those bidders who have quoted earlier, in response to our earlier advertisement should not bid again and their earlier bids will only be considered.** The Director, IIT Mandi, reserves the right to select the item (in single or multiple units) or to reject any quotation wholly or partly without assigning any reason. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

Terms and Conditions:

1. The technical and financial bids should be quoted separately and put in different sealed envelopes marked "**Technical bid**" or "**Financial bid**" as applicable. These separate bids envelopes are to be put in an outer envelope which should also be sealed.

2. The Vendors who have earlier supplied the equipment to any of the IITs, IISc, IISERs and other Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.

3. The technical and financial bids should be submitted in original. The financial bid should include the cost of main equipment/item and its accessories. If there is any separate cost for installation etc. that should be quoted separately.

4. Each individual sealed envelope as well as the outer envelope should be marked with the following reference on the top left hand corner: "**IITMANDI/Admin/PUR-136 /2013-14/6208-09"**

5. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance.

6. The rates should be quoted in figures (typed or printed) and cutting should be avoided. The final amount should be in figures as well as in words. If there are cuttings, they should be duly initialed, failing which the bids are liable to be rejected.

7. Any bids received after **4:00 p.m. on 31st December, 2013** shall not be considered

8. The Technical Bids will be opened on **02nd January, 2013 at 02:30pm.** The date & time for opening of Financial Bids will be informed later.

9. While sending rates, the firm shall give an undertaking to the effect that "*the terms/conditions mentioned in the enquiry letter/Tender Notice against which the rates are being given are acceptable to the firm*." In case the firms do not give this undertaking, their rates will not be considered.

10. If the supplier/firm is original equipment manufacturer (OEM)/authorized dealer/sole distributor of any item, the certificate to this effect should be attached.

11. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.

12. All tender documents should have to be sent through courier, speed post or registered post only. All tender documents received after the specified date and time shall not be considered.

The postal address is:

"AR Stores and Purchase"
Indian Institute of Technology Mandi (IIT Mandi),
Administrative Block (Mandav Hotel, Near Bus Stand), Mandi – 175001 (H.P), India"

13. In the event of any dispute or difference(s) between the vendee Institute (IIT Mandi) and the vendor(s) arising out of non-supply of material or supplies not found according to specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to "The Director, IIT Mandi", Mandi who may decide the matter himself or may appoint arbitrator(s) under the arbitration and conciliation Act1996. The decision of the arbitrator shall be final and binding on both the parties.

14. The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.

15. All disputes shall be subject to Mandi Jurisdiction only.

16. All tenders in which any of the prescribed conditions is not fulfilled or any condition is put forth by the tenderer shall be summarily rejected.

17. The bidders or their authorized representatives may also be present during the opening of the Technical Bid, if they desire so, at their own expenses.

Price bids of only those bidders will be opened whose technical bids are found suitable by the committee appointed for the purpose. Date and time of opening of price bids will be decided after technical bids have been evaluated by the committee. Information in this regard will be posted on

Institute's web site / Notice board. In exceptional situation, an authorized committee may negotiate price with the qualified bidder quoting the lowest price before awarding the contract.

1. **Clarifications**:

   In case the bidder requires any clarification regarding the tender documents, they are requested to contact our office (e-mail: shekhar@iitmandi.ac.in & aks@iitmandi.ac.in on or **before 26/12/2013**.

2. **Tender Cost**:

   A Demand draft of **Rs. 1,000/-(Rupees One Thousand only)** towards non-refundable **tender fee, for each item being quoted, drawn in favour of "The Registrar, IIT Mandi"** payable at Mandi should accompany the Technical bid documents. If the same firm is submitting bids for more than one instrument, they should submit the same in separate envelopes along with respective tender cost for each. In the absence of tender cost, the tender will not be accepted.

3. **Earnest Money Deposit (EMD)**:

   If the cost of the equipment/items is more than Rs. 2 lakhs, a refundable amount @ 2% of the quoted price as earnest money deposit (EMD) in the shape of DD from Nationalized banks in India (valid for a minimum period of 6 months from the date of opening of tender) should be submitted. The DD should be drawn in favour of "The Registrar, IIT Mandi" payable at Mandi should accompany the bid documents. The EMD should be kept in a separate sealed envelope, should be marked clearly and put in the outer envelope that contains the technical and financial bid envelopes. The bidders should enclose a pre-receipted bill for the EMD to enable us to return the EMD of unsuccessful bidders. Failure to deposit **Earnest Money in each case** will lead to rejection of tender.

4. **Pre – Qualification Criteria**:

   a. Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed.

   b. An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.

   c. OEM should be internationally reputed Branded Company.

   d. Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.

   e. Furnishing of wrong/ambiguous information in the compliance statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.

5. **Prices**:

a) The Prices quoted should be inclusive of all taxes or duties, packing, forwarding, freight, insurance, delivery and commissioning etc. at destination site (IIT Mandi, Mandi). IIT Mandi is registered with DSIR, Govt. of India and is exempted from Custom / Excise Duty. Exemption Certificate to this effect will be issued by IIT Mandi. **Hence, Customs/Excise Duty exempted price should be quoted**. The rates shall be firm and final. Nothing extra shall be paid on any account. **In the price bid/financial bid, the vendor should clearly mention the final price breakup i.e. ex-work price/FCA price, FOB price, CIP/CIF price & FOR IIT Mandi, Kamand Campus price, as applicable in their bid.**

b) In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. For imported equipment, the Letter of Credit will be opened for the amount excluding agency commission in Indian Rupees. The firm should clearly mention the address of foreign bank in the financial bid.

6. **Validity**:

The bid should be valid for acceptance up to a period of 180 Days. The Bidders should be ready to extend the validity, if required without any additional financial implications.

7. **Delivery**:

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 24 weeks of the issue of purchase order unless otherwise prescribed. If the bidder fails to deliver and place any or all the Equipments or perform the service by the specified date, penalty at the rate of 1% per week of the total order value subject to the maximum of 10% of total order value will be deducted.

8. **Training**:

Bidders need to provide adequate training to the nominated persons of IIT Mandi at their cost. IIT Mandi will not bear any training expenditure.

9. **Warranty Declaration**:

Bidders must give the comprehensive onsite warranty as required from the date of successful installation of Equipment against any manufacturing defects and also give the warranty declaration that "*everything to be supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.*

Any deviation in the material, and the specifications from the accepted terms may liable to be rejected and the bidders need to supply all the goods in the specified form to the satisfaction / specifications specified in the order / contract and demonstrate at the their own cost.

If the cost of equipment is above Rs. 25 lakhs, a performance bank guarantee from a nationalized bank for an amount equal to 10 % of the price for a duration of two months beyond the expiry of warranty period will be taken from the supplier or Indian agent.

10. **Terms of Payment**: Payment will generally be made only after delivery and satisfactory installation, testing, commissioning etc. **This must be specified in the tender/quotation.**

    • In case of imported supplies, payment (excluding Indian agency commission, if any) will be made through irrecoverable Letter of Credit in two installments. 80 % of the money will be released on submission of shipping of documents. Remaining 20 % will be released after successful installation of the instrument and submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty.

11. **Tender expenses and documents**: All costs incurred by the bidder in the preparation of the tender shall be at the entire expense of the bidder.

12. **Tender Evaluation Criteria**: The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened.

13. **Return of EMD**:

    - The earnest money of unsuccessful bidders will be returned to them without any interest within fifteen working days after awarding the contract.
    - The earnest money of the successful bidder will be returned to them without any interest after completing the successful contract

14. **Manual and documentation**: All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument.

15. Bidders should go through the tender terms, conditions and specifications carefully and fill in the attached compliance statement accurately and unambiguously. They should ensure that all the required documents are furnished along with the bid.

Sd/-
Assistant Registrar
Stores & Purchase

BID PARTICULARS

1. Name of the Supplier :

2. Address of the Supplier :

3. Availability of demonstration of equipment : Yes / No

4. Tender cost enclosed: : Yes/No if yes

D.D. No._____ Bank_____ Amount_____

5. EMD enclosed : Yes / No if Yes

D.D. No._____ Bank_____

6. Name and address of the Officer/contact person to whom all references shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No :

e-Mail :

Web

Annexure- 1

Ref:-ENQUIRYNO:- **IITMANDI/Admin/PUR-136/2013-14/Physical Property Measurement System.**

IIT Mandi requires a **fully automated** computer controlled **cryogen-free "Physical Property Measurement System"** operational in the temperature range 1.9 K - 400 K and magnetic fields up to 14 Tesla. The instrument should be capable of performing measurements like DC/AC Resistivity, Hall Effect, Heat Capacity, Thermal Conductivity, and Thermoelectric power measurements. Prospective vendors should also provide other accessories and facilities including UPS, Water Chiller for smooth installation and uninterrupted operation of the equipment.

Technical Specifications:

1. Basic unit

System should be fully cryogen-free, i.e. no requirement of liquid helium or liquid nitrogen. The system should be fully automated and computer controlled with the latest technology for instrument interfacing and control.

A) Temperature control:

A1. Temperature Range: 1.9 K – 400 K, fully automated

A2. Temperature stability: ± 0.02 % or better, irrespective of the magnitude of applied magnetic field.

A3. Cooling Rate: 300 K to 1.9 K in $\leq$ 1 hr

A4. Temperature control modes: Fast Settle, No Overshoot, and Sweep mode

B) Superconducting magnet

B1. Longitudinal field configuration: 0 ±14 Tesla (continuously variable) with 1 mT resolution

B2. Field uniformity: ±0.1% in the 5.5 cm of sample space region

B3. Field control modes: Persistent and Driven (Oscillating, No Overshoot and Fast settle)

B4. The magnet should be quenching protected with proper built in safety measures.

2. Measurement Probes

A) ***Electrical transport (AC and DC resistivity).***

A1. Four wire AC/DC measurements over 1.9 K to 400 K, for resistivity, Hall Effect, and I-V characteristics.

A2. Absolute Accuracy in R: 0.03% typical for R < 100 ohm and 0.2 % overall with relative accuracy ± 10 nohm or lower.

A3. AC current: Lower limit of 100 nA, and Higher limit of100 mA or higher with frequency range: 10 Hz or lower to 1 kHz or higher,

A4. Resistance range: Lower limit - 20 microOhm or lower, and Higher Limit - 1 GigaOhms or higher

B) **Heat capacity measurement system:**

B1. Relaxation technique, two-tau model fit analyses, corrections of back grounds from sample platform, adhesives through sophisticated software routines that is fully Integrated to the main system software

B2. Temperature Range: 1.9 K – 400 K, with a ± 0.1% between 2 K to 10 K.

B3. Sample Mass: 1 – 20 mg or more

B4. Measurement Accuracy: ≤ 5% over 2K – 300K

B5. Heat Capacity resolution: ≤ 10 nJ/mole.K at 2 K temperature

C) Thermal transport:

C1. Should be able to measure the thermal conductivity, thermoelectric power (Seebeck Coefficient), and resistivity and thermoelectric figure of merit.

C2. Thermal conductance measurement accuracy: ≤ ± 5 %

C3. Typical accuracy of the Seebeck coefficient: ≤ ± 5 % (~0.5 micro V/K)

C4. Typical accuracy of the thermoelectric figure of merit: ± 15% or better

C5. Temperature range: 1.9 K to 400 K

C6. AC resistivity (specification matching that of electrical transport)

3. Data acquisition and analysis

Licensed windows based operating software and state-of-the-art computer control system compatible with and optimized for the application software to run the various measurement options automatically.

4. Vacuum pump and vacuum fittings

Vacuum pumps and fittings along with vacuum gauges, meter, standard vacuum coupling essential for the uninterrupted functioning of the instrument and its various measurements options must be included.

5. Other accessories:

Uninterrupted Power Supply (UPS): A highly reliable UPS with at least 1 hour back up must be provided. Specify make and model number in your quotation. After sale service of the UPS will be the responsibility of the vendor offering the PPMS system.

Water Chiller: A good quality and reliable water chiller of appropriate capacity, compact in size, must be supplied, if required. Specify the make and model number in the quotation. After sale service of the water cooler will be the responsibility of the vendor offering the PPMS system.

List of the optional accessories for various options should also be mentioned separately

6. Details of the standard samples to be provided by the company for testing the instruments at the time of installation at site for the demonstration of the performance of equipment.

7. Guarantee / Warranty:

The tender must be quoted with three years on-site comprehensive Warranty/Guarantee commencing from the date of complete and satisfactory installation of the equipment against the defect of any manufacturing, workmanship and poor quality of the components. The water chiller and the UPS should have a warranty for a period of three years from the date of installation. This should also include the service required for the cold head.

8) Helium gas (99.999%) required for running the instrument should be supplied for three years. Accessories required for the transfer of Helium gas should also be supplied.

Note:

1. Operation and service manual in English (electronic and hard copy) should be provided with the equipment.

2. In the technical details, specify clearly about the kind of service/maintenance required for the system. Also mention that whether the service has to be carried out by a company engineer or it can be carried by trained service personnel within India.

3. Training of all PPMS options: Free complete training to IIT Mandi user members, onsite.

4. Enclose pre-installation guide for the details on electrical power, space and other accessories.

5. Bid should include all other essential auxiliary equipment and spares for its operation (please provide list with details).

6. All sample handling kits/consumables also should provided

7. Wherever, consumable sample holders/mounts (such as PCB mounts, capsules, etc.) or other items, to handle samples while loading into a measurement probe must be quoted separately for enough quantity.

8. Quote separately for all optional items/accessories/probes which are not explicitly specified above.

9. Quote separately for essential Cryogenic consumables like GE-7031 Varnish, Apiezon N, M & H Grease, low thermal solder, Kapton tape, and also for **4 extra resistivity pucks, 2 extra un-calibrated heat capacity and 1 thermal transport pucks**.

10. Essential spares for pumps, control electronics, gas handling manifold, connecting lines, cables, O-rings and electrical fuses must be provided.

11. The required accessories for the compressor should also be provided.

12. A list of institutes (with details) in India where similar equipment (with 14 Tesla magnet) has been sold or is under operation should be provided. Prospective vendor should clearly mention the type of measurement probes (along with the main system) supplied to these institutes.

13. The manufacturer has to stand guarantee for the relocation of the system from the present campus of IIT Mandi (at Kamand), to another campus of IIT Mandi (about 3 km) when it gets ready. They must be in a position to dismantle the setup in the present campus and re-install it to the new campus.

Compliance statement

for low temperature high magnetic field Physical Properties Measurement System (PPMS)

Note: The vendor should provide complete details in the compliance statement.

S. N.	Required Indent Specifications	Please mention your remarks in Yes or No format or mention the value or details
1	Is Tender fees attached?	
2	Is EMD attached? (if applicable)	
3	Is the bidder original equipment manufacturer (OEM)/authorised dealer?	
4	If authorized dealer, recent dated certificate to this effect from OEM,attached or not ?	
5	Undertaking from OEM regarding technical support & extended warranty present	
6	Validity of 180 days or not?	
7	Undertaking from bidder regarding acceptance of tender terms & conditions	
8	List of reputed users for the past three years specific to the instrument	
9	Whether special educational discount for IIT Mandi given	
10	Whether two weeks of training of operator and research students without any charge offered	
	Technical Specifications	
11	**Basic Unit** (a) System should be fully cryogen-free, i.e. no requirement of liquid helium or liquid nitrogen. (b) The system should be fully automated and computer controlled with the latest technology for instrument interfacing and control.	

A.	**Temperature control: Fully automated ramping**	
i.	Temperature Range: 1.9 K – 400 K,	
ii.	Temperature stability: ±0.02 % or better, irrespective of the magnitude of applied magnetic field.	
iii.	Cooling Rate: 300K to 1.9 K in < 1 hr	
iv.	Temperature control modes: Fast Settle, No Overshoot, and Sweep mode	
B.	**Superconducting magnet**	
i.	Longitudinal field configuration: 0 ±14 Tesla (continuously variable) with 1 mT resolution	
ii.	Field uniformity: ±0.1% in the 5.5 cm sample space region	
iii.	Field control modes: Persistent and Driven (Oscillating, No Overshoot and Fast settle)	
iv.	The magnet must be protected from quenches (Specify the technology used for protection)	
12	**Measurement Probes**	
A.	**Electrical transport (AC and DC Resistivity)**	
i.	4-wire resistivity measurement over 1.9 K to 400 K, Hall Effect, I-V characteristics	
ii.	Absolute Accuracy: 0.03% typical for R < 100 ohm and 0.2 % overall with relative accuracy ± 10 nohm or lower	
iii.	AC current: Lower limit of 100 nA, and Higher limit of 100 mA or higher with frequency range: 10 Hz or lower to 1 kHz or higher	
v.	Resistance range: Lower limit of 20 microOhm or lower, and Higher Limit of 1 GigaOhms or higher	
B.	**Heat capacity measurement system**	
i.	Relaxation technique, two-tau model fit analyses, corrections of back grounds from sample platform, adhesives, etc., through sophisticated software routines that is fully integrated to the main system software.	
ii.	Temperature Range: 1.9 K – 400 K with a ± 0.1% between 2 K to 10 K.	
iii.	Sample Mass: 1 – 20 mg or more	
iv.	Measurement Accuracy: better than 5% over 2K – 300K	

v.	Heat Capacity resolution: ≤ 10 nJ/mole-K at 2 K temperature	
C	**Thermal transport**	
i.	Should be able to measure the thermal conductivity, thermoelectric power (Seebeck coefficient), electrical resistivity and thermoelectric figure of merit.	
ii.	Thermal conductance measurement accuracy: ≤ ± 5 %	
iii.	Typical accuracy of the Seebeck coefficient: ≤ ± 5 %	
iv.	Temperature range: 1.9 K to 400 K	
v.	AC resistivity (specification matching that of electrical transport)	
13	**Data acquisition and analysis** Licensed windows based operating software and state-of-the-art computer control system compatible with and optimized for the application software to run the various measurement options automatically.	
14.	**Vacuum pump and vacuum fittings** Vacuum pumps and fittings along with vacuum gauges, meter, standard vacuum coupling essential for the uninterrupted functioning of the instrument and its various measurements options must be included.	
15.	**Other accessories:** *Uninterrupted Power Supply (UPS):* A highly reliable UPS with at least 1 hour back up must be provided. Specify make and model no. in your quotation. After sale service of the UPS will be the responsibility of the vendor offering the PPMS system. *Water Chiller:* A good quality and reliable water chiller of appropriate capacity, compact in size, must be supplied, if required. Specify the make and model no. in the quotation. After sale service of the water cooler will be the responsibility of the vendor offering the PPMS system. **List of the optional accessories for various measurement**	

	modes should be provided	
16.	Details of the standard samples to be provided by the company for testing the instruments at the time of installation at site for the demonstration of the performance of equipment.	
17.	**Guarantee / Warranty:** The tender must be quoted with three years on-site comprehensive Warranty / Guarantee commencing from the date of complete and satisfactory installation of the equipment against the defect of any manufacturing, workmanship and poor quality of the components. The water chiller and the UPS should be warranted for a period of three years from the date of installation. This should also include the service required for the cold head.	
18.	Helium gas (99.999%) required for running the instrument should be supplied for three years. Accessories required for the transfer of Helium gas should also be supplied.	
19.	The system must be operable on the electrical supply parameters available at the Institute as:- 415 VAC plus or minus 10%, 3-phase, 50 Hz. The offer must certify that all the machinery, equipment, instruments and controls will keep working and will remain safe at these parameters of electrical supply.	
20.	Others.	
i.	Operation and service manual in English (electronic and hard copy) should be provided with the equipment.	
ii.	In the technical details specify what kind of service/maintenance is required for the system. Whether this service has to be carried out by a company engineer or it can be carried by trained service personnel within India.	
iii.	Training of all PPMS options: Free complete training to IIT Mandi user members, onsite.	
iv.	Enclose pre-installation guide for the details on electrical power, space and other accessories.	
v.	Bid should include all other essential auxiliary equipment, accessories and spares for its operation (please provide list with details).	

vi.	All sample handling kits/consumables should also be provided	
vii.	Wherever applicable the consumable like sample holders/mounts (such as PCB mounts, capsules, etc.) or other items required to handle samples, while loading into a measurement probe, must be quoted separately for enough quantity.	
viii.	Quote separately for all optional items/accessories/probes which are not explicitly specified above.	
ix.	Quote separately for essential Cryogenic consumables like GE-7031 Varnish, Apiezon N, M & H Grease, low thermal solder, Kapton tape, and also for 4 extra resistivity pucks, 2 extra un-calibrated heat capacity pucks and 1 thermal transport puck.	
x.	Essential spares for pumps, control electronics, gas handling manifold, connecting lines, cables, O-rings and electrical fuses must be provided.	
xi.	The required accessories for the compressor should also be provided.	
xii.	A list of institutes (with details) in India where similar equipment (with 14 Tesla magnet) has been sold or is under operation should be provided. Prospective vendor should clearly mention the type of measurement probes (along with the main system) supplied to these institutes.	
xiii.	The manufacturer has to stand guarantee for the relocation of the system from the present campus of IIT Mandi (at Kamand), to another campus of IIT Mandi (about 3 km) when it gets ready. There must be in a position to disassemble the setup in the present campus and re-install it to the new campus, if required.	